## **Spot Safety Project Evaluation**

Project Log # 200501263

Spot Safety Project # 04-94-201

Spot Safety Project Evaluation of the Shoulder Mounted "Industrial Entrance" Signs and Signal Installation at US 70 and SR 1570 (Pony Farm Rd) in Johnston County

Documents Prepared By:

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## Spot Safety Project Evaluation Documentation

### **Subject Location**

Evaluation of Spot Safety Project Number 04-94-201 – The shoulder mounted "Industrial Entrance" signs and Signal Installation at US 70 and SR 1570 (Pony Farm Rd) in Johnston County.

#### **Project Information and Background from the Project File Folder**

US 70 is a four-lane divided facility with a speed limit of 55 mph. SR 1570 is a two-lane facility that forms the southern leg of the treatment intersection. An industrial plant complex driveway forms the northern leg of the treatment intersection. There is no posted speed limit for SR 1570.

The problem statement was that increasing traffic created a lack of sufficient gaps to allow vehicles to safely enter the traffic flow on US 70. A previous crash study was completed for the intersection from November 1, 1990 through October 31, 1996. A total of 6 crashes occurred at this location; there were 3 Angle, 2 Rear End and 1 Left Turn crash. The original countermeasures chosen for the subject location were to install shoulder mounted "Vehicle Entering When Flashing" signs on both approaches of US 70 and a traffic signal at the intersection. At a later date in the planning process, the "Vehicle Entering When Flashing" sign was changed to "Industrial Entrance, Next 4 Crossovers" with a continuous post mounted flasher. The final completion dates for the improvements at the subject location were on August 7, 1997\* for the signs and May 1, 1998 for the signal. The total cost of the project is not stated due to the changes made and lack of documentation in the background folder.

\*Please note that the project background folder shows August 7, 1997 as the final inspection date for the Industrial Entrance signs.

#### **Naive Before and After Analysis**

After reviewing the spot safety project file folder along with all the crashes along the subject road, the crash data omitted from this analysis was from July 1997 through June 1998. The "Industrial Entrance" signs were installed on August 7, 1997, therefore July 1997 was omitted for an adequate construction period. A signal was installed in May 1998 therefore June 1998 was omitted for an adequate construction period. The before period consisted of reported crashes from January 1, 1990 through June 30, 1997 (7 years, 6 Months) and the after period consisted of reported crashes from July 1, 1998 through December 31, 2005 (7 Years, 6 Months). The ending date for this analysis was determined by the available crash data in the before period.

The treatment data consisted of all crashes within 150 feet of the subject intersection on all four legs. The following data table depicts the Naive Before and After Analysis for the above information. Please note that Frontal Impact crash types were the target crashes for the applied countermeasures. These crash types considered are as follows: Left Turn, same roadway; Left Turn, different roadway; Right Turn, same roadway; Right Turn, different roadway; Head On, and Angle.

Treatment Information			
	Before	After	Percent Reduction (-) Percent Increase (+)
Total Crashes	8	37	362.5
Total Severity Index	5.6	6.2	11.1
Frontal Impact Crashes	4	6	50.0
Frontal Severity Index	8.4	17.3	106.3
Volume	24200	31200	28.9
Treatment Injury Crashes			
	Before	After	Percent Reduction (-) Percent Increase (+)
Fatal	0	0	N/A
Class A	0	1	N/A
Class B	2	2	0.0
Class C	3	14	366.7
Property Damage Only	3	20	566.7
Frontal Injury Crashes			
	Before	After	Percent Reduction (-) Percent Increase (+)
Fatal	0	0	N/A
Class A	0	1	N/A
Class B	2	0	-100.0
Class C	2	3	50.0
Property Damage Only	0	2	N/A

Table 1.

The naive before and after analysis at the treatment location resulted in a 363 percent increase in Total Crashes, a 50 percent increase in Frontal Impact Crashes, and a 29 percent increase in Average Daily Traffic (ADT). The before period ADT year was 1993 and the after period ADT year was 2002.

#### **Results and Discussion**

The naïve before and after analysis involving the comparison of treatment actual before data versus treatment actual after data resulted in a 363 percent increase in Total Crashes and a 50 percent increase in Frontal Impact Crashes. The summary results above demonstrate that the treatment location appears to have had an increase in the number of Total Crashes and an increase in the number of Frontal Impact Crashes from the before to the after period.

Referencing the collision diagrams there was a significant increase in total crashes at the treatment intersection. The before period includes 8 total crashes, 4 of which were frontal impacts. The after period shows 37 total crashes, 6 of which were frontal impacts. After looking at the crash types in the after period report and collision diagram, the dominating crash type in the after period is rear end crashes.

	Before	After	Percent Reduction (-) Percent Increase (+)
Rear End Crashes	2	28	1300.0
Rear End Severity Index	1.0	4.4	343.6

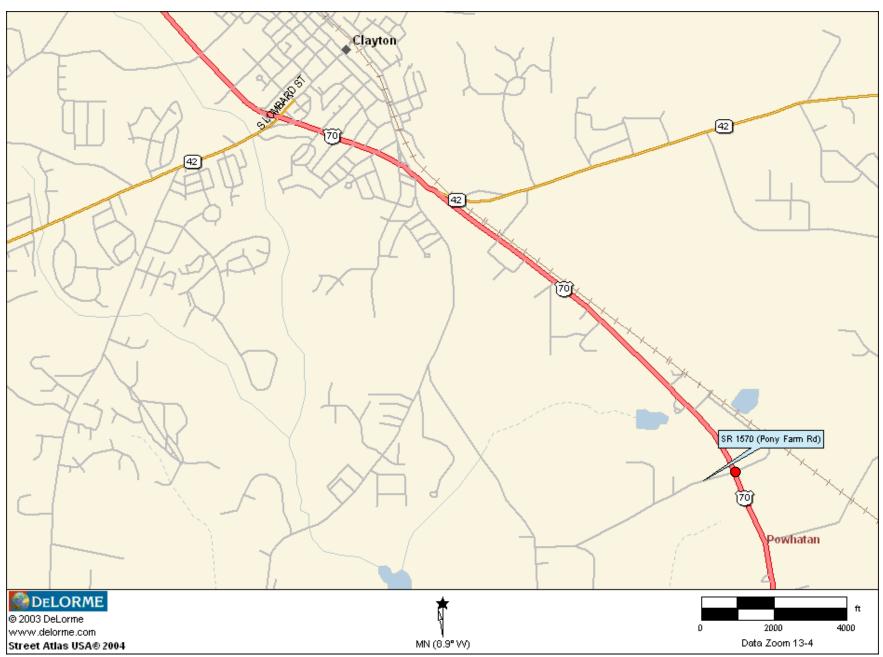
Table 2a.

Rear End Injury Crashes				
	Before	After	Percent Reduction (-) Percent Increase (+)	
Fatal	0	0	N/A	
Class A	0	0	N/A	
Class B	0	2	N/A	
Class C	0	11	N/A	
Property Damage Only	2	15	650.0	

Table 2b.

During the field investigation a distance of approximately 1.7 miles existed from the treatment intersection to the first signal west of SR 1570. More than two miles separated the treatment intersection from another signal on the east leg of US 70 (until a signal was activated at SR 1901 and US 70 on 4/25/06). The distance between signals may allow drivers to reach higher speeds and lower their expectation of the approaching signal, which may reduce their reaction time when approaching a stopped vehicle at a traffic signal.

As the Safety Evaluation Group completes additional spot safety reviews for this type of countermeasure, we will be able to provide objective and definite information regarding actual crash reduction factors for this type of road.



Location Map: Johnston County, US 70 at SR 1570 (Pony Farm Rd).

# Treatment Site Photos taken May 18, 2005



On US 70 facing east





On US 70 facing west



On US 70 driving west

